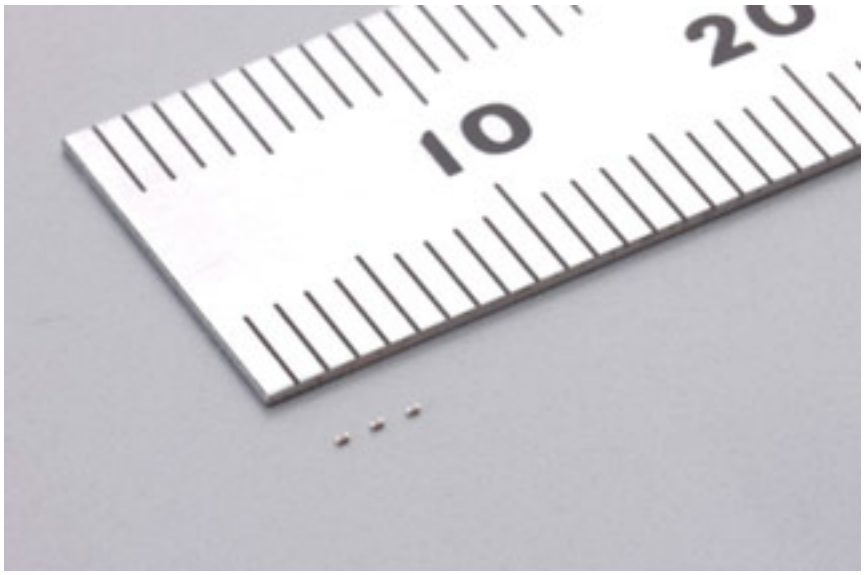
Commercialization of the World's First 0402-size Hi-Q-type MLCC(2)

Murata Manufacturing



Overview

Murata Manufacturing Co., Ltd. has introduced the world's first and smallest 0402-size (0.4 x 0.2mm) Hi-Q Type[*1] MLCC called the "GJM02 series" to the market.

Background

The number of components assembled in the latest electronic products has increased against a backdrop of development of compact mobile devices with higher functionality such as cellular phones, while at the same time there is strong demand for packages with smaller footprints. Under the circumstances, there is an increasing need for miniaturization of high-frequency low-loss (Hi-Q) -type Monolithic Ceramic Chip Capacitors (MLCC) that are used for high-frequency module applications such as power amplifiers. Previously, the smallest Hi-Q-type MLCC was 0603-size (0.6 x 0.3mm). This time, Murata has commercialized the "GJM02 series," the world's first 0402-size Hi-Q-type MLCC.

In addition, several issues related to the mounting of components require attention: 1) difficulty in improving the mounting process cleanliness because of paper fluff and dust of taping mount when the conventional paper taping method is used; 2) product pick-up errors caused by static electricity; and 3) memory module damage caused by Electro-Static Discharge (ESD). For these reasons, there is a demand for a new method of packaging ultrasmall components. The GJM02 series has introduced a new packaging style called W4P1 tape[*2].

Features

The GJM02 series contributes to: 1) reducing the footprint; 2) reducing the equipment profile; 3) reducing power consumption with Hi-Q and low ESR characteristics; and 4) improving the production process yield by using the new W4P1 tape packaging style.

- Downsizing from 0603-size Hi-Q-type MLCC (GJM033) possible.
- Optimal for the coupling[*3] application for high-frequency operation.
- Hi-Q and low ESR[*4] at frequency bands including VHF, UHF, and microwave frequency range.
- Controls narrow capacitance deviation.

Using the new packaging style W4P1 tape provides the following advantages:

- Cleaner mounting process.
- Prevention of defects caused by static electricity.
- Reduction of packaging material waste.
- Reduction of component transportation and storage costs.

Applications

Power amplifier and high-frequency module applications

Terminology

*1 Hi-Q:	As a result of reviewing the materials used for the GJM02 series, it was confirmed that the GJM02 series has a higher Q value[*]in the VHF, UHF, and microwave frequency ranges compared with standard MLLCs (GRM series). * Q value is the reciprocal of loss rate of the Dissipation Factor (DF). The loss is less when the Q value is higher.
*2 W4P1:	4mm-wide embossed tape (plastic tape) with 1mm component mounting pitch
*3 Coupling:	Function for shutting down DC signals and allowing only AC signals to pass.
*4 ESR:	Equivalent Series Resistance

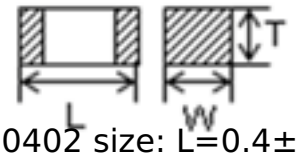
Part Number

Typical example: CH characteristics, 10pF, J tolerance (±5%) : GJM0222C1C100JB01

Electrical Performance

Temperature characteristics:	CK (0 ±250ppm/°C) , Capacitance value 0.2pF to 2.0pF CJ (0 ±120ppm/°C) , Capacitance value 2.1pF to 3.9pF CH (0 ±60ppm/°C) , Capacitance value 4.0pF to 10pF
Rated voltage:	16Vdc
Capacitance range:	0.2 to 10pF
Operating temperature range:	-55°C to +125°C

External Size



0402 size: L=0.4±0.02, W=0.2±0.02, T=0.2±0.02 (Unit: mm)

Production

Mass production starts September 2011

SOURCE [1]

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http://www.ecnmag.com/news/2011/09/commercialization-worlds-first-0402-size-hi-q-type-mlcc2?qt-recent_content=0

Links:
[1] http://rss.murata.co.jp/item_148281_2928345_7978.html